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Mean Density of the Earth; which is the Adams prize essay for 1893. GRIFFIN: London, 1894.

WILSING. *Publicationen des Astrophysikalischen Observatoriums zu Potsdam*, Nr. 22.

BOYS. *Philosophical Transactions*, vol. 186.

BRAUN. *Denkschriften der Kaiserlichen Akad. zu Wien*, Bd. 64.

Popular accounts and reviews of some of the above methods are to be found in

Nature, vol. 50, pp. 330, 366, 417; vol. 56, p. 127.

Himmel und Erde, Bd. X, p. 385.

Vierteljahrschrift der Astronomischen Gesellschaft, Bd. 24, p. 18.

POYNTING'S prize essay contains a valuable historical account of the subject.

ASTRONOMICAL OBSERVATIONS IN 1898.

MADE BY TORVALD KÖHL, AT ODDER, DENMARK.

VARIABLE STARS.

*Z Cygni.**

January 10: Z = a.
11: id.
22: id.
27: $\begin{cases} < \text{a.} \\ > \text{b.} \end{cases}$
29: id.
February 19: = c.
April 14: invisible.
26: id.
May 7: id.
August 14: = a.
18: a little > a.
21: id.
24: > a.
September 5: much > a.

September 10: $\begin{cases} > \text{a.} \\ < \text{A.}\dagger \end{cases}$
22: id.
October 3: id.
6: almost = A.
9: < A.
26: = a.
November 1: $\begin{cases} < \text{a.} \\ > \text{b.} \end{cases}$
4: = b.
6: id.
22: $\begin{cases} < \text{d.} \\ > \text{e.} \end{cases}$
December 3: < e.
13: id.
18: id.

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* *Vide* the sketch in the *Publications* A. S. P., No. 48, page 69.

† The position of *A* (7. Magn.) referred to 26 *Cygni* is: $\Delta\alpha = +1^m 52^s$
$\Delta\delta = +12'.1$

*X^2 Cygni and the Stars A and B near it.**

May	7:	X^2 < A a little < B. > a
August	14:	< g > h A < B.
August	18:	id.
	21:	= h, A < B.
	24:	id.
September	5:	id.
	7:	id.
	10:	id:
	15:	< h, A = B.
	17:	< h, A < B.
	22:	id.
	23:	id.
October	3:	< k, A $\leqq$ B.
	6:	id.
	9:	id., A < B.
	14:	id.
	26:	invisible. A $\overset{=}{<}$ B.
November	1:	A $\overset{=}{>}$ B.
	6:	A < B.
	22:	A = B.
December	3:	id.
	13:	A $\overset{=}{<}$ B.
	20:	A > B.

S Ursæ Majoris.

January	10:	S invisible.
	21:	id.
	27:	id.
February	19:	> e. < d.
March	15:	= e.
	19:	a little < d.
	21:	id.
	23:	= d.
April	1:	id.
	3:	a little > d.
	7:	> d.
	13:	> d. < c.
	26:	id.
May	7:	id.
	19:	= d.
July	21:	invisible.
August	14:	< g.
	18:	id.
	24:	id:
September	5:	a little > f.
	7:	= f.
September	10:	= g.
	15:	= f.
	17:	> f. < e.
	22:	= e.
	23:	id.
	25:	id.
	27:	id.
	30:	id.
October	3:	= d.
	6:	id.
	9:	id.
October	14:	id:
	25:	id:
November	1:	> d.
	4:	id.
	6:	id.
	22:	> d. < c.
December	3:	a little > d.
	13:	= d.
	18:	a little < d.
	20:	id.

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* *Vide* the sketch in *Publications* A. S. P., No. 34, page 37, and the observations in No. 48, page 71.

T Ursæ Majoris.

January	10:	T = c.
	21:	= a.
	27:	a little < a.
February	19:	id.
March	15:	< c. > d.
	19:	a little > d.
	21:	id.
	23:	= d.
April	1:	< d. > e.
	3:	a little > e.
	7:	id.
	13:	some > e.
	26:	a little < e.
May	7:	= g.
	19:	id.
July	21:	invisible.
August	14:	id.
	18:	id.
	24:	= f.
September	5:	a little < e.
	7:	id.
September	10:	> e.
	15:	= c.
	17:	id.
	22:	> b. < a.
	23:	id.
	25:	a little > a.
	27:	> a.
	30:	id.
October	3:	> a. = c in the region about S.
	6:	id.
	9:	= b (S).
	14:	id.
	25:	id.
November	1:	id.
	4:	< c (S).
	6:	much > a.
	22:	= a.
December	3:	= b.
	13:	= c.
	18:	a little > d.
	20:	= d.

*W Pegasi.**

January	8:	W < g.
	10:	id.
	11:	id.
	21:	id.
	22:	id.
	27:	id.
August	14:	a little > c. < b.
	18:	id.
	21:	id.
	24:	id.
September	5:	a little < c.
	7:	< c.
	10:	a little < c.
September	15:	id.
	17:	< c.
September	22:	< c. > d.
	23:	= d.
	25:	< d.
October	3:	= e:
	6:	= f.
	9:	id.
	14:	a little < f.
	26:	invisible in moonlight.
November	1:	a little < g.
	4:	= g.

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* *Vide* the sketch in the *Publications* A. S. P., No. 60, page 23.

November 6: id.
22: $< g$.

December 3: id.
13: id.
18: id.

The Stars $\left\{\begin{matrix} 12 & \text{and} & 13 \\ 14 & \text{``} & 16 \end{matrix}\right\}$ *Comæ Berenicis.*

January 22: $12 > 13$ and $14 = 16$.
29: $12 > 13$ id.
March 23: $12 < 13$ id.
April 1: $12 = 13$ id.
7: $12 > 13$ id.
13: $12 > 13$ id.
14: $12 > 13$ id.

Mira Ceti.

January 22: *Mira* = 70 *Ceti*.
September 12: = α *Piscium*.
October 3: = α *Ceti*.
6: id.
9: id.
14: id.
November 1: id.
4: a little > α *Piscium*.

November 6: id.
22: $= \xi^2$.
December 3: $= \xi^1$.
13: = V.
18: a little > 71.

The Red Star near ζ Tauri.

The star No. 144 in Chandler's (No. 121 in Birmingham's) Catalogue of red stars, mentioned in the *Publications* A. S. P., No 61, page 72, has not in the past year shown any remarkable variations. On several dates I have looked out for this star = BD. 20°. 1083, and have compared it with its neighbor, the star BD. 20°. 1073. When the ocular-tube was screwed out until the stars appeared as pale discs, I always found the red star fainter, contrary to what was the case in preceding years.

Meteors observed from Stations in Denmark.

No.	M. European Time.			Beginning.	End.	Mag.	Note.
		h	m				
1	Jan. 2,	9	15 P.M	Near *Procyon*	Near *Regulus*	*	Fireball, seen at Roskilde, yellow and blue. ˉs.
2	31,	9	50		20° alt. N.N.E.	*	Fireball, seen at Glyngôre; violet. 2–3s.
				° °	° °		
3	Aug. 11,	10	1	215 + 70	228 + 52	2	
4			21	255 + 77	243 + 56	2	
5			32	14 + 53	353 + 46	♃	Train.
6			34	289 + 40	294 + 23	2	
7			40	233 + 70	236 + 61	3	
8			43	157 + 66	150 + 64	1	
9			44	288 + 40	280 + 24	1	
10			48	20 + 49	7 + 35	2	
11			50	209 + 73	214 + 52	2	
12			56	218 + 37	224 + 23	1	
13			56	353 + 25	7 + 40	3	
14		11	4	8 + 33	359 + 21	2	Train.
15			5	215 + 38	214 + 27	♃	
16			6	55 + 40	55 + 32	1	
17			8	353 + 28	342 + 20	1	Train.
18			11	256 + 22	253 + 10	3	
19			12	2 + 27	353 + 16	1	
20			13	292 + 28	288 + 9	2	
21			17	177 + 53	181 + 45	4	
22			23	258 + 89	236 + 78	3	
23			29	301 + 37	301 + 37	3	Stationary.
24			34	191 + 67	191 + 53	3	
25			36	347 + 21	341 + 15	3	
26			37	272 + 22	258 + 25	4	Slow.
27			39	331 — 2	324 — 6	3	
28			46	170 + 78	194 + 61	2	
29			49	294 + 28	283 + 13	1	
30			58	186 + 52	192 + 43	1	Nos. 3–30 were observed at Odder.
31	Aug. 11,	10	2	294 + 31	282 + 7	2	
32			4	258 + 44	228 + 19	1	Streak.
33			32	62 + 62	68 + 60	1	
34			47	68 + 57	68 + 57	1	Stationary.
35			51	38 + 56	21 + 55	♃	Train.
36		11	0	15 + 55	13 + 64	2	Streak.
37			14	38 + 41	24 + 41	1	
38			23	58 + 49	60 + 39	1	Nos. 31–38 were observed at Nyborg.
39		10	22	312 + 34	298 + 5	1	Train.
40			33	210 + 59	264 + 63	1	
41			35	325 + 51	307 + 16	1	
42			35	210 + 88	234 + 65	1	
43			51	15 + 35	356 + 33	1	Train.
44			53	314 + 15	337 + 14	2	
45			55	15 + 46	2 + 43	1	
46			56	205 + 47	206 + 32	1	
47			58	274 + 39	262 + 26	1	Train.
48			59	267 + 30	266 + 3	2	Train.
49		11	0	15 + 35	6 + 37	1	
50			4	31 + 35	23 + 31	1	
51			8	15 + 35	10 + 25	1	Train.

No.	M. European Time.			Beginning.	End.	Mag.	Note.
		h	m	° °	° °		
52	Aug. 11,	11	11 P.M.	251 + 39	251 + 19	1	
53			12	274 + 22	282 + 5	1	Train.
54			12	15 + 35	8 + 25	1	
55			16	272 + 59	257 + 41	1	Train.
56			18	280 + 80	192 + 75	2	
57			21	260 + 33	258 + 12	1	
58			22	22 + 50	7 + 47	1	Long train.
59			37	281 + 44	252 + 42	1	
60			37	352 + 46	341 + 39	1	
61			38	1 + 15	353 + 8	1	Train.
62			39	343 + 28	334 + 17	2	
63			40	7 + 63	349 + 57	1	
64			41	234 + 38	234 + 16	1	
65			42	359 + 67	340 + 61	2	
66			47	265 + 40	264 + 10	1	
67			51	296 + 10	284 − 8	1	Yellow.
68			52	316 + 10	311 − 9	♃	Train.
69			57	38 + 52	37 + 39	1	Train.
70			59	22 + 40	18 + 30	2	
71			59	265 + 54	261 + 55	1	
72	Aug. 12,	10	3	333 + 7	323 + 1	3	
73			7	296 + 5	282 − 5	1	Train.
74			8	347 + 49	337 + 36	1	
75			10	355 + 58	340 + 49	2	
76			12	2 + 50	348 + 36	1	Train.
77			13	237 + 31	231 + 23	2	
78			15	232 + 35	222 + 25	1	
79			20	254 + 38	254 + 12	1	Train.
80			30	164 + 64	173 + 55	2	Nos. 39-80 observed at Fredericia.
81	Aug. 11,	10	9	33 + 33	31 + 28	*	Train.
82			14	360 + 28	357 + 25	*	
83			16	162 + 61	165 + 57	*	
84			18	292 + 46	289 + 18	*	Train.
85			25	185 + 70	170 + 60	*	
86			32	356 + 55	348 + 53	*	
87			38	206 + 50	202 + 45	*	
88			44	13 + 29	356 + 25	*	Train. Nos. 81-88 observed at Brandstrup.
89	Aug. 12,	10	8	308 + 40	294 + 5	1	
90			10	355 + 61	350 + 55	3	
91			16	339 + 61	321 + 54	2	
92			21	41 + 45	31 + 38	3	
93			51	30 + 65	12 + 66	1	Train.
94		11	3	359 + 48	356 + 39	3	
95			7	11 + 26	5 + 23	3	
96			13	340 + 61	312 + 55	2	
97			18	210 + 85	206 + 64	2	
98			31	315 + 29	309 + 23	2	
99			32	312 + 25	310 + 20	2	
100			49	354 + 32	347 + 25	3	
101			53	344 + 34	339 + 26	2	
102		12	3	21 + 41	29 + 37	3	Nos. 89-102 observed at Ulkeböl
103	Aug. 15,	9	51	128 + 60	158 + 53	♃	Observed at Storehedinge.
104	18,	10	25	275 + 15	262 + 17	2	Observed at Odder.

No.	M. European Time.	Beginning.	End.	Mag.	Note.
105	Oct. 21, 10^h 45^m P.M.		Near β *Urs. Maj.*	*	Fireball, seen at Copenhagen, and Bornholm. Train in 2m.
106	Nov. 16, 3^h 17^m A.M.	170° + 35°	197° + 41°	2	Train, yellow.
107	34	167 + 25	176 + 17	3	
108	39	158 + 45	162 + 33	3	
109	39	154 + 50	166 + 68	2	
110	44	123 + 29	111 + 35	3	Train.
111	48	166 + 7	174 + 1	4	Nos. 106–111 observed at Odder.
112	17, (?)		N.N.E.	*	Fireball, seen at Aalborg. 10s.
113	Dec. 19 11 2 P.M	90 + 8	88 − 9	*	Fireball. seen at Horsens. Red and blue.

Aurora Borealis.

A most magnificent display of northlight was seen here in Denmark on the night of September 9–10. In Odder I observed the phenomenon from 8^h 30^m to 11^h 15^m P. M., and noted all remarkable circumstances. At 9^h 30^m and again at 9^h 42^m the corona appeared near ϵ *Cygni*. At this moment the electric bells in the great telegraph station at Fredericia rang without any visible cause, and the telegraphic service was disturbed for hours during the auroral displays. A very large sun-spot crossed the Sun's central meridian at this very time, and its connection with the northlight is evident. Also it may be noted that we had very hot weather, unusual for the season, in the beginning of September, October, and November — and every time large sun-spots were observed.

PLANETARY PHENOMENA FOR MARCH AND APRIL, 1899.

By Professor Malcolm McNeill.

March.

Mercury is an evening star during the whole month, and for the latter half of the month it is far enough away from the Sun to be seen in the evening twilight. It comes to greatest eastern elongation with the Sun on March 24th, and on that date sets a little more than an hour and a half after sunset.